Laboratory Preparedness and Response to Terrorist Events Involving the Nation's Food Supply

Bala Swaminathan, Ph.D.

Foodborne and Diarrheal Diseases Branch

DBMD, NCID, CCID

Foodborne Disease Laboratory Activities

- **Confirmation and characterization of etiologic agents and/or their toxins**
  - *E. coli* O157:H7 and other STEC
  - Other pathogenic *E. coli*
  - *Salmonella* including S. Typhi
    - Serotyping
  - *Campylobacter* spp.
  - *Shigella* including *S. dysenteriae* type 1
  - *Vibrio cholerae* and other pathogenic vibrios
  - *Yersinia enterocolitica*
  - *Clostridium botulinum* (botulinum toxins)
- **Isolation and characterization of pathogens from foods during outbreak investigations**

CDC

Salmonella Surveillance

- 2500+ serotypes
- Top 100 serotypes account for 98% of human disease
- From public health standpoint, important to determine the serotype
- Real-time serotype information can be effectively used in Surveillance Outbreak Detection Algorithm to detect increases (over background) of common serotypes

CDC

PulseNet Surveillance

- Proven and effective early warning system for detecting foodborne disease clusters

- Pathogens tracked: *E. coli* O157:H7, *Salmonella, Shigella, Listeria, Campylobacter, Vibrio cholerae* (2005)

- New tools have been developed to enhance PulseNet's effectiveness
  - Database in SQL format
  - Automated pattern naming
  - Web Service Tool for cluster detection

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Web Service Tool for automated cluster detection

- Daily cluster finding

- Search for pattern numbers in PulseNet database by isolate ID

- Frequency and geographic information on specific patterns

- Graphical representation of data

PulseNet USA — The National Molecular Subtyping Network for Foodborne Disease Surveillance — CDC

Admin   Query   Labs

Daily Outbreak
Isolate Search
Outbreak Search

Pathogen
[Ecoli ▾]

Select a Day

< February 2005 >

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	1	2	3	4	5
6	7	8	9	10	11	12

Isolate Number	Outbreak	SourceCountry	SourceState	SourceType	IsolatDate	UploadDate	UploadModifiedDate	Serotype	PFGE-Xbal-pattern	PFGE-Xbal-status	PFGE pattern
MI 05ST000141		USA	MI	Human	2005-02-06	2005-02-15		E. coli O157:H7	EXHX01.2565	Confirmed	EXHA
CDC K1508-C4		USA				2005-02-15	2005-02-15	E. coli O128:H12 ST	EXHX01.17102@	Unconfirmed	EXHA
CDC K1510-C8		USA				2005-02-15	2005-02-15	E. coli O128:H12 ST	EXHX01.17102&	Unconfirmed	EXHA
CDC K1504-C3		USA				2005-02-15	2005-02-15	E. coli O15:H18 EAgg	EXHX01.17101@	Unconfirmed	EXHA
CDC K1516-C3		USA				2005-02-15	2005-02-15	E. coli O15:H18 EAgg	EXHX01.17101&	Unconfirmed	EXHA
CDC K1529-C1		USA				2005-02-15	2005-02-15	E. coli O15:H18 EAgg	EXHX01.17101&	Unconfirmed	EXHA
CDC K1508-C3		USA				2005-02-15	2005-02-15	E. coli O15:H18 EAgg	EXHX01.17101&	Unconfirmed	EXHA
CDC K1504-C1		USA				2005-02-15	2005-02-15	E. coli O6:H16 LT/ST	EXHX01.17100@	Unconfirmed	EXHA
CDC K1506-C2		USA				2005-02-15	2005-02-15	E. coli O6:H16 LT/ST	EXHX01.17100&	Unconfirmed	EXHA

The data in these results should not be published without written permission from the PulseNet database team.

Show Map   Show Chart

● EXHX01.0047

Cluster Graph From 02/09/2004 To 02/09/2005

www.dotn
Development Ver

Weeks

.net Charting

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CDC
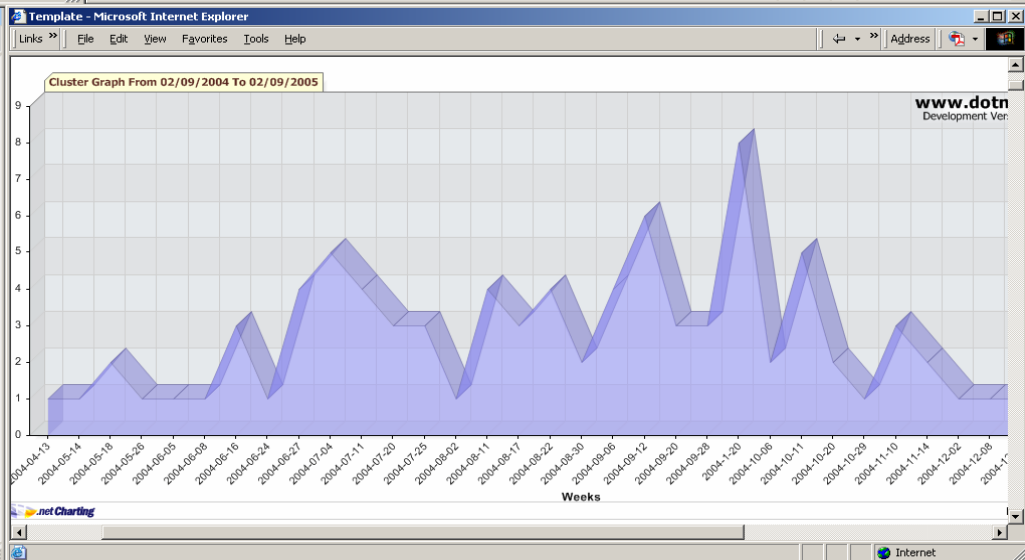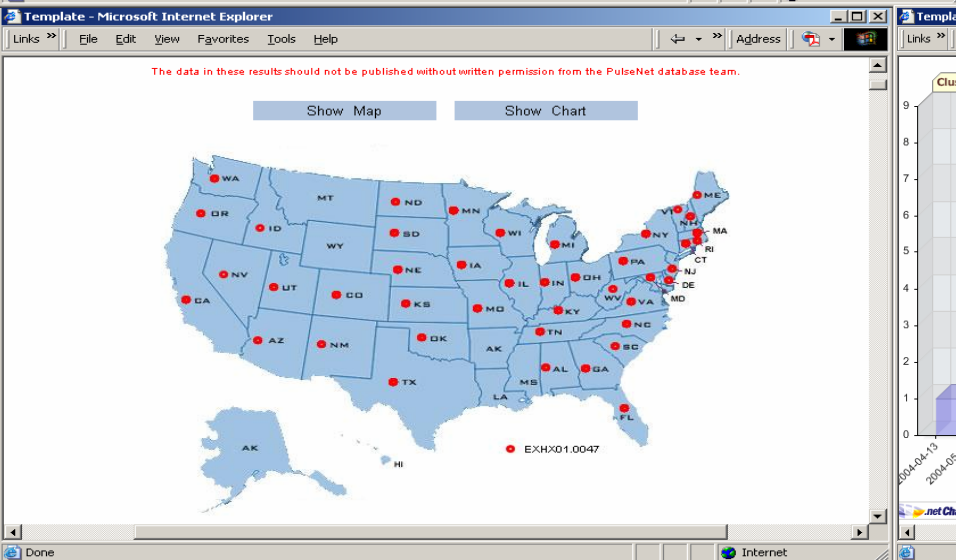
PulseNet Gaps

- Failure to receive isolates in a timely manner from primary laboratory
- Failure to process isolates in a timely manner in the public health laboratory
- Failure to submit DNA "fingerprint" patterns to the National Database
- Failure to inform epidemiologists in a timely manner
  - ◆ Inadequate information provided to epidemiologists

Leveraging Terrorism Cooperative Agreement

- **Goal 2: Decrease the time needed to classify health events as terrorism or naturally occurring, in partnership with other agencies**
  - Improve isolate submission by Level A Laboratories
  - Enhance capacity to apply standardized molecular epidemiologic methods in real-time

Leveraging Terrorism Cooperative Agreement

- **Goal 2: Decrease the time needed to classify health events as terrorism or naturally occurring, in partnership with other agencies**
  - Improve/expedite data sharing on suspected or confirmed cases of foodborne illness between public health epidemiologists, laboratory personnel, and other stakeholders.

CDC

Leveraging Terrorism Cooperative Agreement

- **Goal 3: Decrease the time needed to detect chemical, biological, radiological agents in tissue, food or environmental samples that cause threats to public's health**

  - ◆ **If your laboratory does not have the capacity to test FOOD specimens for specific agents used in biological or chemical terrorism, identify appropriate neighboring laboratories that can perform this task, and develop protocols for sending specimens to these laboratories in a food bioterrorism event**

Leveraging Terrorism Cooperative Agreement

- **Goal 5: Increase the number of health events reported to CDC**
  - ◆ **Perform real-time subtyping of PulseNet tracked foodborne disease agents**
  - ◆ **Promptly* submit the subtype data and associated critical information electronically to the national PulseNet database to facilitate early disease cluster detection.**
    - •**Within 72-96 h of receiving isolate Level A lab; ultimate goals is <48 h**

CDC

Questions?

Bala Swaminathan, Ph.D.
CDC
404-639-3669
bas5@cdc.gov